

RIA: Radioisotope Production and Biomedical Applications

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Requirements for Radioisotope Production

- Source of accelerated particles or neutrons
- Facilities for processing and handling highly radioactive materials
- Facilities for storage and disposal of radioactive wastes

The U.S. DOE Isotope Program

- Use irradiation facilities around the world
 - LANL, BNL, ORNL, PNNL, TRIUMF, INR, NAC, PSI, MURR
- Processing facilities primarily at LANL, BNL
- Stable isotopes at ORNL, LANL

Example Nuclides

Nuclide	Half Life	Amounts
Cu-67	2.58 d	10 Ci/mo (8×10^{18} atoms)
Pd-103	17.0 d	40 Ci/mo (6×10^{20} atoms)
Sr-82	25.4 d	2 Ci/mo (2×10^{19} atoms)
As-73	80.3 d	0.5 Ci/yr (1×10^{19} atoms)
Cd-109	462 d	2 Ci/yr (5×10^{20} atoms)
Ge-68	271 d	0.8 Ci/mo (7×10^{19} atoms)
Si-32	170 yr	200 μ Ci/yr (1×10^{18} atoms)
Al-26	7.2×10^5 yr	2 μ Ci/yr (6×10^{19} atoms)

Biomedical Applications

- Particle Beam Therapy
 - Requirements
 - Can RIA contribute?
- Other?